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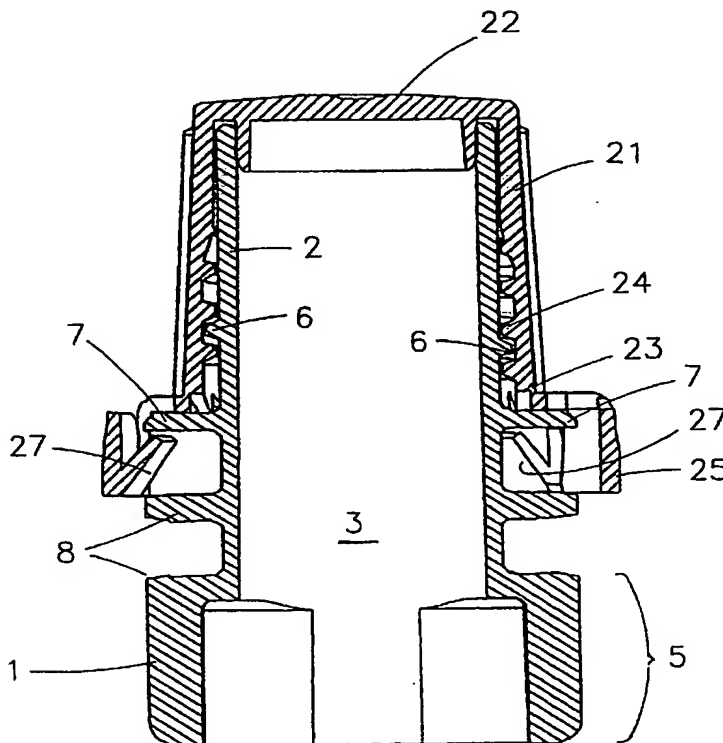
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(54) Title: THEREATED CAP PROVIDED WITH TAMPER-EVIDENT BAND



(57) Abstract: A container having a neck (2), which surrounds an opening (3) in the container, and a plastic collar (21), which can be screwed onto the neck and has a top side and an underside and an outer circumference. The neck is provided with a first screw thread and the collar is provided with a second screw thread (24). Beneath the first screw thread, the neck is provided with a blocking rib (7) which projects radially outwards. On the underside, the collar is provided with a tamper-evident ring (25), which ring is provided, on the inner circumference, with inwardly projecting flexible blocking members (27), which are distributed around the circumference, in such a manner that when the collar is being screwed onto the neck the flexible blocking members pass over the blocking rib, and when the collar is being unscrewed the blocking rib forms a stop for the blocking members, resulting in one or more parts of the collar being broken.

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— as to the applicant's entitlement to claim the priority of the
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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

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THEREATED CAP PROVIDED WITH TAMPER-EVIDENT BAND

The invention relates to a combination of a container having a neck, which surrounds an opening in the container, and a plastic collar, which can be screwed onto the neck, in accordance with the preamble of claim 1. The invention also relates to a plastic
5 collar which is intended for a combination of this type and to an object in which a collar of this type is integrated.

The collar may, for example, form (an integral) part of a closure member for the container.

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In a preferred application of the invention, the collar is an integral part of a screw cap, for example having a closure wall running transversely with respect to the circumferential wall of the collar.

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The collar could also be designed as a securing collar for fixing an object, for example a pump enabling the contents of the container to be dispensed via the pump, in the neck of the container.

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All kinds of different embodiments of a combination according to the preamble of claim 1 and a collar which is intended for this combination are known.

25 US 5,819,965 has disclosed a screw cap with tamper-evident ring, in which breakable bodies are present between that part of the collar of the screw cap which is provided with the screw thread and the tamper-evident ring. When the cap is unscrewed for the first time, the breakable bodies break and the tamper-evident
30 ring remains behind on the neck of the container.

One drawback of this known screw cap is that the tamper-evident ring remains behind on the container. Particularly if the container is intended for a beverage which is suitable for human

consumption and it is intended or can be expected that the consumer will put the container to his mouth in order to drink the beverage, there is a risk of the tamper-evident ring becoming detached and entering the mouth.

5

DE 87 16625 has disclosed a screw cap with a tamper-evident ring to which flexible blocking members are secured, the document disclosing ring segments and breakable bridges between the ring segments.

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A significant drawback of this known screw cap is that it is difficult to produce it by injection-moulding, since the flexible blocking members are oriented in such a manner with respect to the cap that they point towards the cap. If this device is made in a mould using the injection-moulding method, the cap will be very difficult to remove from the mould after the injection-moulding has taken place. It is impeded by the flexible blocking members. The cap or the mould will have to be deformed in order for the cap to be removed from the mould.

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It is an object of the present invention to provide an improved plastic collar which avoids the abovementioned drawback.

Another object is to provide a plastic collar which allows simple production.

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The present invention provides a combination according to the preamble of claim 1, which is characterized in that each connecting body extends radially inwards from the top side of the ring segment, and each ring segment has an associated single connecting body which extends over a smaller circumferential angle than the associated ring segment, so that there is an opening between circumferentially successive connecting bodies, and the blocking member which is associated with a ring segment being arranged offset, as seen in the circumferential direction, with respect to the connecting body.

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The present invention also provides a plastic collar according to claim 5.

The plastic collar according to the invention which can be screwed onto the neck of a container, and advantageous embodiments thereof, will be explained in more detail below with reference to the drawing, in which:

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Fig. 1 shows a perspective view of an exemplary embodiment of a screw cap according to the invention and a spout which can be sealed in a film/foil pouch and has a neck onto which the cap can be screwed,

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Fig. 2 shows a side view of the screw cap and spout shown in Figure 1, with the cap having been screwed onto the neck of the spout,

15 Fig. 3 shows a plan view, on a larger scale, of the screw cap and spout from Figures 1 and 2, and

Fig. 4 shows a vertical section, on a larger scale, through the screw cap and spout shown in Figures 1 and 2, on line IV-IV in Figure 3.

20

The figures show a combination of a spout 1 and a screw cap 20.

The spout 1 is made from plastic and is intended to be sealed in a film/foil pouch, so that the spout 1 forms part of a container, for example for a beverage which is suitable for human consumption.

25

The spout 1 has a body with a substantially cylindrical neck 2, which surrounds an opening 3, in the present example of a passage for supplying a medium to the container and/or discharging a medium from the container.

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The bottom part 5 of the spout 1 is designed to be sealed between two opposite walls of the film/foil pouch.

35

The neck 2 is provided, in its top part, with a first screw thread 6. Furthermore, beneath the first screw thread 6 the neck 2 is provided with a blocking rib 7 which projects radially

outwards.

In this example, the spout body 1 is provided with a number of further circumferential ribs 8 which are used to enable the spout body to be handled.

The screw cap 20 is likewise produced by injection-moulding in a suitable injection mould.

The screw cap 20 has a collar 21, which can be screwed onto the neck 2 and has a transverse wall 22, which extends transversely over the top side of the collar 21, and has an underside 23 and an outer circumference, which in this case is provided with ribs for improving grip on the screw cap 20.

The collar 21 is provided, on the inner side, with a second screw thread 24, which is complementary to the first screw thread 6 in order for the cap 20 to be screwed onto the neck 2.

On the underside, the screw cap 20 is provided with a tamper-evident ring 25, which will be explained in more detail below with reference to Figures 1-4.

The tamper-evident ring 25 has a plurality of ring segments 26, in the present example three, which lie adjacent to one another as seen in the circumferential direction of the ring 25.

Each ring segment 26 is provided, on the inner side, with an inwardly projecting flexible blocking member 27. In this example, each blocking member 27 is designed as a flexible lip which projects obliquely upwards from the inner side of the ring segment 26 and is integral with the ring segment 26 only at its bottom end.

On its top side, each ring segment 26 is integrally connected to the collar 21 via a single, unbreakable and flexible connecting body 28.

In this case, the connecting body 28 extends radially inwards

from the top edge of the ring segment 26 and adjoins the bottom edge 23 of the circumferential wall 21 of the screw cap 20.

The connecting body 28 extends over a smaller circumferential angle than the associated ring segment 26, so that there is an opening 29 between circumferentially successive connecting bodies 28. Moreover, the blocking member 27 associated with a ring segment 26 is arranged offset, as seen in the circumferential direction, with respect to the connecting body 28.

In particular, in the embodiment shown the connecting body 28 is located in the vicinity of the front end, as seen in the unscrewing direction, of a ring segment 26 and the blocking member 28 behind it, in this example close to the rear end of the associated ring segment 26. This arrangement of these components with respect to one another is advantageous with a view to unscrewing the cap 20, but other arrangements are also conceivable within the context of the invention.

A significant advantage of the measures described above is that it is possible to make do with a relatively simple injection mould for production of the screw cap 20.

Each ring segment 26 is connected to the adjacent ring segments 26 via thin, breakable bridges 30. These bridges 30 are in this case located close to the bottom edge of the ring segments 26.

The design of the cap 20, and in particular of the tamper-evident ring 25 thereof, means that when the cap 20 is being screwed onto the neck 2, the flexible lips 27 pass over the blocking rib 7 without the breakable bridges 30 being damaged. In this way, the lips 27 then engage behind the underside of the blocking rib 7.

When the cap 20 is being unscrewed for the first time, the lips 27 come into contact with the underside of the blocking rib 7. When the cap 20 is unscrewed further, the forces generated in the tamper-evident ring 25 are such that one or more breakable

bridges 30 of the tamper-evident ring 25 break. As a result, the ring segments 26 with the lips 27 can move outwards and the lips 27 can move past the blocking rib 7.

- 5 It is important that the ring segments 26 remain integral with the screw cap 20 and therefore do not remain behind on the neck 2. The fact that the bridges 30 have broken is clearly visible, so the consumer can see whether the cap has previously been opened.

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It will be clear that the neck may also form an integral part of a container, for example a (plastic) bottle.

CLAIMS

1. A combination of a container having a neck (2), which surrounds an opening (3) in the container, and a plastic collar (21), which can be screwed onto the neck and has a top side and an underside and an outer circumference, the neck (2) being provided with a first screw thread (6) and the collar (21) being provided with a second screw thread (24), which is complementary to the first screw thread in order for the collar to be screwed onto the neck, and the neck of the container being provided, beneath the first screw thread, with a blocking rib (7) which projects radially outwards, and the collar being provided on the underside with a tamper-evident ring (25), which ring is provided on the inner circumference with inwardly projecting flexible blocking members (27), which are distributed around the circumference, in such a manner that when the collar is screwed onto the neck the flexible blocking members (27) pass over the blocking rib, and when the collar (21) is being unscrewed the blocking rib forms a stop for the blocking members (27), resulting in one or more parts of the collar breaking, the tamper-evident ring (25) comprising a plurality of ring segments (26) which lie next to one another in the circumferential direction, each ring segment (26) being provided, on the inner side, with a blocking member (27), and each ring segment (26), via at least one unbreakable and flexible connecting body (28), being integral with the collar, and each ring segment (26) being connected, via breakable bridges (30), to the adjacent ring segments, in such a manner that when the collar (21) is unscrewed for the first time, the blocking members (27) come into contact with the blocking rib (7) and break one or more breakable bridges (30) of the tamper-evident ring (25), so that the ring segment (26) with the blocking members (27) can move outwards and the blocking members can move past the blocking rib,
- 35 **characterized in that** each connecting body (28) extends radially inwards from the top side of the ring segment (26), and each ring segment (26) has an associated single connecting body (28) which extends over a smaller circumferential angle than the associated ring segment, so that there is an opening (29)

between circumferentially successive connecting bodies (28), and the blocking member (27) which is associated with a ring segment (26) being arranged offset, as seen in the circumferential direction, with respect to the connecting body (28).

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2. The combination according to claim 1, in which a blocking member (27) is a lip which projects obliquely upwards and inwards from the inner side of the ring segment (26).

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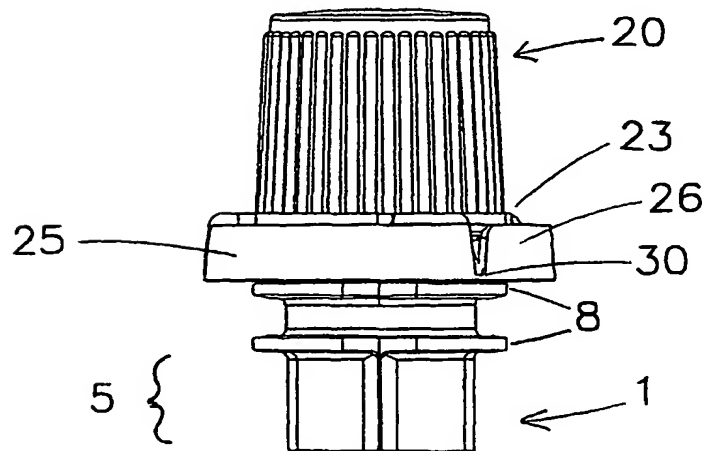
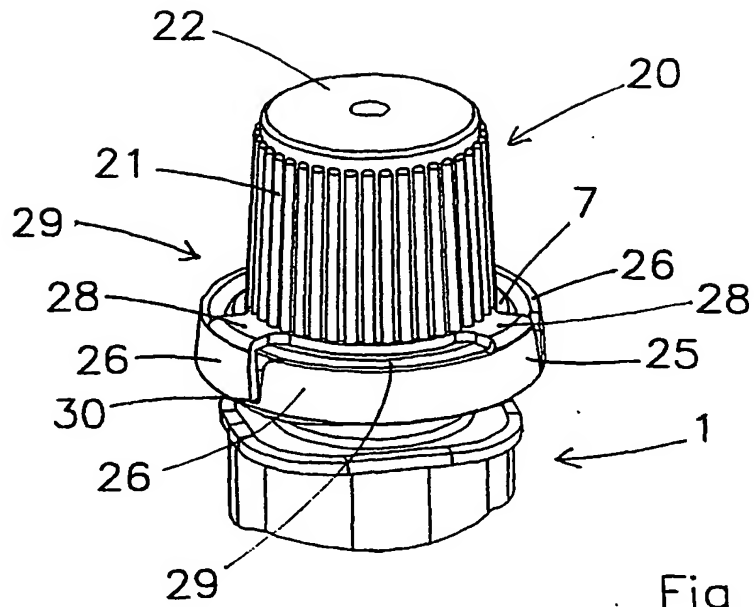
3. The combination according to one or more of the preceding claims, in which the breakable bridges (30) are located in the vicinity of the underside of the ring segments (26).

15

4. The combination according to one or more of the preceding claims, in which the collar (21) forms part of a closure member for closing the opening in the neck of the container, in particular of a screw cap (20).

20

5. Plastic collar according to one or more of the preceding claims which can be screwed onto a neck (2) of a container.



DTIC Reference 26 JUL 2004

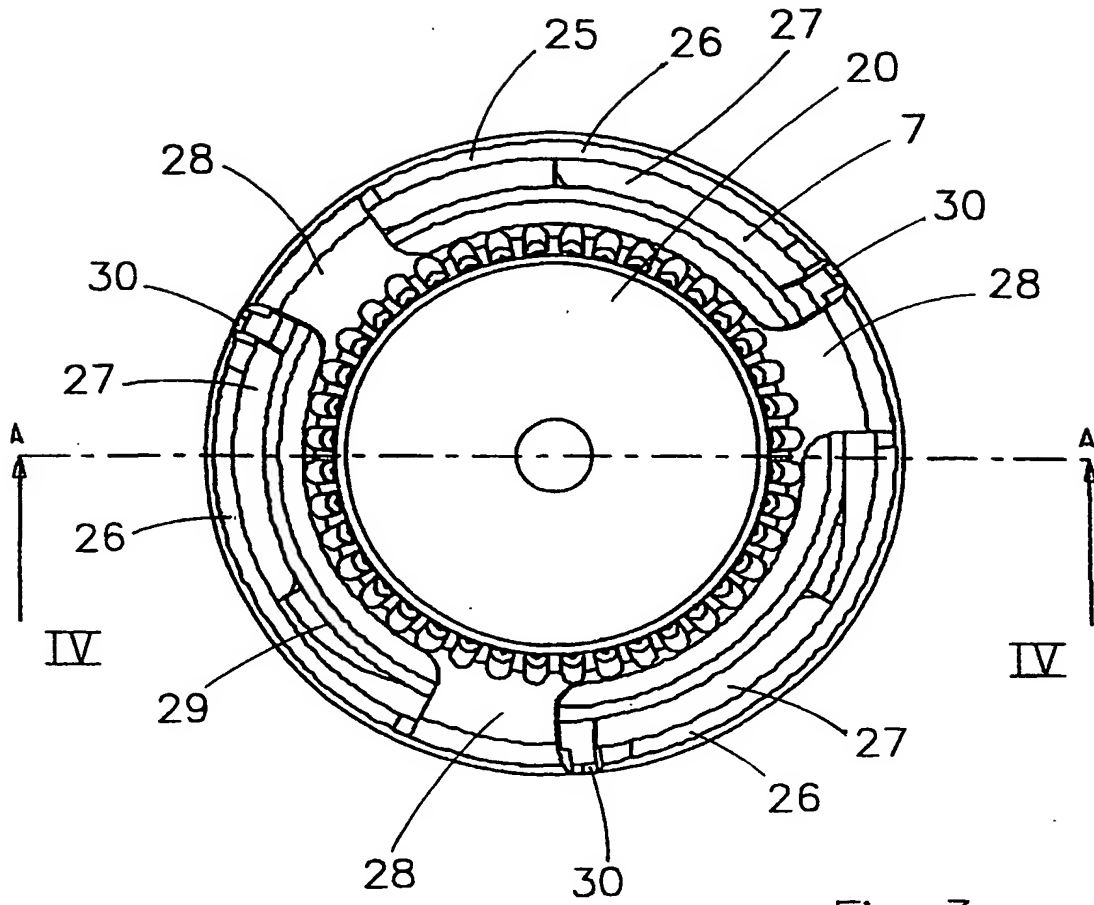


Fig 3

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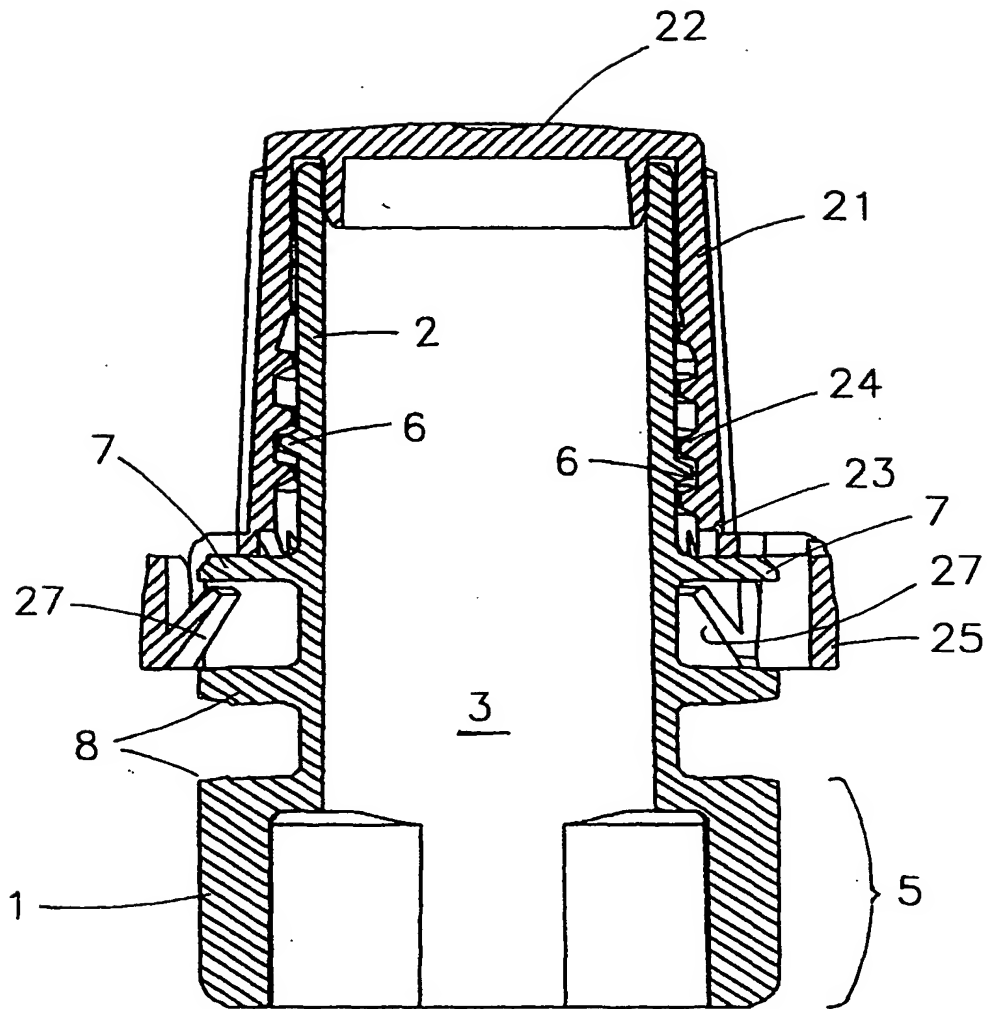


Fig 4

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D41/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 548 329 A (CURRY JOHN J) 22 October 1985 (1985-10-22) the whole document ---	1-5
A	DE 87 16 625 U (N.BAREIN) 24 March 1988 (1988-03-24) the whole document ---	1-5
A	DE 80 18 224 U (ALCOA GMBH VERPACKWERKE) 30 October 1980 (1980-10-30) the whole document ---	1-5
A	WO 96 00172 A (CROWN CORK AG ;HERRMANN KLAUS JUERGEN (DE); KIRCHGESSNER MICHAEL () 4 January 1996 (1996-01-04) the whole document --- -/--	1-5



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

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Name and mailing address of the ISA

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 32 24 002 A (FINKE ROBERT KG) 29 December 1983 (1983-12-29) the whole document -----	1-5

INTERNATIONAL SEARCH REPORT

PCT/NL 03/00078

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4548329	A	22-10-1985	CA 1288388 A1	03-09-1991
DE 8716625	U	24-03-1988	DE 8716625 U1	24-03-1988
DE 8018224	U	30-10-1980	DE 8018224 U1	30-10-1980
WO 9600172	A	04-01-1996	AT 179135 T	15-05-1999
			AU 687201 B2	19-02-1998
			AU 2520995 A	19-01-1996
			BR 9505499 A	12-08-1997
			WO 9600172 A1	04-01-1996
			CN 1129926 A ,B	28-08-1996
			DE 59505704 D1	27-05-1999
			EP 0714369 A1	05-06-1996
			ES 2132665 T3	16-08-1999
			HU 74662 A2	28-01-1997
			IL 114036 A	10-03-1998
			JP 9502412 T	11-03-1997
			NZ 285721 A	24-02-1997
			PL 313137 A1	10-06-1996
			RU 2141917 C1	27-11-1999
			US 6116451 A	12-09-2000
			US 5893474 A	13-04-1999
			ZA 9505205 A	14-02-1996
DE 3224002	A	29-12-1983	DE 3224002 A1	29-12-1983

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